Peter Lynn Therkelsen

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EDUCATION:

Doctor of Philosophy Candidate ***June 2009 (Expected Graduation)***
Mechanical and Aerospace Engineering
University of California, Irvine
Thesis: *Effects of Scale on Homogeneous Charge Compression Ignition Engines*
Research Areas: Homogeneous Charge Compression Ignition Engines, Scaling Laws, Chemical Kinetics Modeling

Masters of Science ***August 2006***
Mechanical and Aerospace Engineering
University of California, Irvine
Thesis: *Evaluation of a Low Emission Gas Turbine Operated on Hydrogen*
Research Areas: Hydrogen Combustion, Gas Turbine Engines, Distributed Power Generation, Chemical Kinetics, Computational Fluid Dynamics

Bachelor of Science ***June 2003***
Mechanical Engineering
University of California, Irvine
Research Areas: Fuel distribution technology, High altitude fuel cells

EXPERIENCE:

Graduate Researcher ***January 2007 to Present***
Laser, Flame and Atomization Laboratory
University of California at Irvine
- Collaborated on a joint UCI and General Electric Environmental Services coal kinetic combustion research project.
- Researched last stages of coal char burnout.
- Utilized Char Burnout Kinetics (CBK) modeling package and Fluent to assist General Electric Environmental Services understand current coal char modeling capabilities.
- Developed and tested experiments to show the effects of magnetic fields on gaseous flames.

Engineering Consultant ***May 2007 to July 2007***
Opto-Knowledge System Incorporated
Irvine, California
- Designed and built balance of plant for flat flame burner.
- Developed and set up burner and use in validating CARS based temperature sensor to client specifications.

Research Fellow ***September 2004 to December 2004***
General Electric Energy Corporation
Greenville, South Carolina

- Developed Matlab tools that interface with GTP software to create corrective parameter control algorithms for gas turbine control software.
- Characterized corrective parameter control algorithms response to fuel variations and created corrective response algorithm.

Engineering Intern ***June 2003 to September 2003***
The Boeing Company ***June 2002 to September 2002***
Everett, Washington

- Designed and developed fuel cell model components in Numeric Propulsion System Simulator for multiple modeling projects.
- Performed and wrote report on preliminary study of multiple configurations of a fuel cell powered single engine aircraft.
- Developed system model of fuel cell auxiliary power unit for Boeing 737 and 777 aircraft Numeric Propulsion System Simulator modeling language.

Senior Design Project ***June 2002 to June 2003***
University of California at Irvine

- Collaborated with three fellow students to develop a 30 kilowatt photovoltaic canopy and fuel cell installation for electric vehicle recharging and distributed generation for the Irvine Transportation Center which provides rail and bus services for area residents and commuters.
- Managed a total budget of $440,000 over twelve months.
- Worked with architects from LPA to create engineering drawings, blueprints and a complete architectural model of the project.
- Interfaced with and presented plans to The Irvine Company and The City of Irvine for approval at key design stages.

Engineering Laboratory Assistant ***October 1999 to June 2003***
University of California at Irvine Combustion Lab/National Fuel Cell Research Center

- Developed and fabricated test rig for high altitude fuel cell experimentation.
- Continued modeling efforts for Boeing fuel cell auxiliary power unit.
- Developed the implementation plan for a distributive microturbine generation system data acquisition and communication system.
- Evaluated and reconstructed the laboratory wide carbon monoxide and combustible gas detection system.
- Assembled ambient weather monitoring station used by UCI Combustion Laboratory, National Fuel Cell Research Center and Advance Power and Energy Program research projects.
- Designed and assembled a liquid fuel distribution system for power generation units.

TEACHING: ***Teaching Assistant Positions***

University of California at Irvine, Mechanical and Aerospace Engineering Courses:

Mechanical Engineering Design ***Winter 2009***
Fluid and Thermal Science Laboratory ***Fall 2007***
Air Pollution and Control ***Spring 2007***
Fundamentals of Combustion and Fuel Cells ***Winter 2004 & 2006***

- Worked directly with professors: Scott Samuelsen, Vince McDonell, Derek Dunn-Rankin and Yun Wang.
- Class size raged from 17 to 93.
- Evaluated and graded homework assignments.
- Created course and testing material.
- Lead regular class lecture, discussion and laboratory sessions.
- Conducted one on one and group office hours.
- Laboratory experiment topics included: measurement error, heat transfer, on campus central plant, gas turbines, flow measurements, wind tunnel, Otto and Diesel cycles and refrigeration.
- Coordinated student research project that culminated in presentations to be given to General Electric regarding zero emission coal power plants.

Research Outreach ***2004 to Present***

University of California at Irvine

- Led monthly tours of the University of California at Irvine Combustion Lab and National Fuel Cell Research Center. Groups ranged from individual tours to 25 persons in size and included visitors from such institutions as US Department of Energy, US Department of Defense, US Environmental Protection Agency, California Energy Commission, California Public Utilities Commission, California Environmental Protection Agency, General Electric, Siemens, Capstone among others.
- Hosted and organized several conferences at the University of California at Irvine Combustion Lab including ILASS, ICEPAG, UCICL Gas Turbine Short Course.
- Created and delivered presentations on laboratory research topics such as advanced turbine technologies to high school aged students as part of UCI COSMOS program.

PUBLICATIONS: **Papers**

Therkelsen, P., Werts, T., McDonell, V. and Samuelsen, S. (2009). "Analysis of NOx formation in a Hydrogen Fueled Gas Turbine Engine" Journal of Engineering for Gas Turbines and Power, Vol. 131, March

Therkelsen, P., Werts, T., McDonell, V. and Samuelsen, S. (2008). "Analysis of NOx formation in a Hydrogen Fueled Gas Turbine Engine" ASME TurboExpo, GT2008-50841, Berlin, Germany

Therkelsen, P., Mauzey, J., McDonell, V. and Samuelsen, S. (2006). "Evaluation of a Low Emission Gas Turbine Operated on Hydrogen" ASME TurboExpo, GT2006-90725, pp 557-564, Barcelona, Spain

Therkelsen, P., Kebria, M. and Dunn-Rankin, D. (2008). "Carbon Burnout Predictions using CBK and Time-Temperature-Oxygen Trajectories through a Coal Boiler" Western States Section of the Combustion Institute, University of Southern California

Jepsen, A., Miller, C., Therkelsen, P., Garman, J., Dunn-Rankin, D. and Hynes, J. (2008). "Characterization of a Small IC Engine Dynamometer" Western States Section of the Combustion Institute, University of Southern California

Oral Presentations

Therkelsen, P., Mauzey, J., McDonell, V. and Samuelsen, S. (2006). "Evaluation of a Low Emission Gas Turbine Operated on Hydrogen" National Hydrogen Association, Long Beach, CA

Therkelsen, P., Mauzey, J., McDonell, V. and Samuelsen, S. (2006). "Evaluation of a Low Emission Gas Turbine Operated on Hydrogen" International Colloquium on Environmentally Preferred Advanced Power Generation, Newport Beach, CA

Bolszo, C.D, Effinger, M.W., Therkelsen, P.L., Mauzey, J., McDonell, V. and Samuelsen, S. (2006). "Contract 500-00-020 Project 2-MTG Fuel Flexability" PIER Final Report Presentation, California Energy Commission, Sacramento, CA

Mauzey, J., McDonell, V. and Samuelsen, S. (2004). "Contract 500-00-020 Project 2-MTG Fuel Flexability" PIER Critical Performance Review, California Energy Commission, Sacramento, CA

Poster Presentations

Therkelsen, P., Garman, J. and Dunn-Rankin, D. (2008). "Platform Development for the Study of Small Scale HCCI Engines" International Symposium of the Combustion Institute, Montreal, Canada

Therkelsen, P., Kebria, M. and Dunn-Rankin, D. (2008). "Entrained Flow Reactor Design using CBK Predictions and Time/Temperature/Oxygen Trajectories Modeled in a Coal Furnace" International Symposium of the Combustion Institute, Montreal, Canada

SKILLS:

Programing: FORTRAN, Matlab, LabView, NPSS
Modeling: CFD-ACE, Chemkin, Fluent, CBK, GTP
Languages: German - Intermediate spoken and written
Fundamentals of Engineering Exam (EIT) Passed June 2004
CAD: Unigraphics, Solidworks Fabrication: Passed UCI engineering machine shop course
Other: MS Office, Proficiency with both PC and Macintosh computer environments